



FLY'S EYE GLM SIMULATOR

Mason G. Quick, Richard J. Blakeslee, Hugh Christian,
Mike Stewart, Scott Podgorny, David Corredor



Objectives

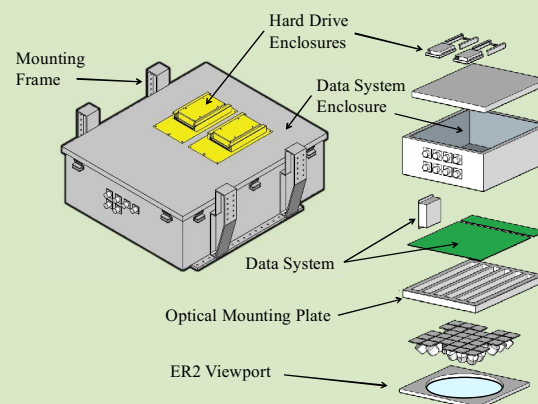
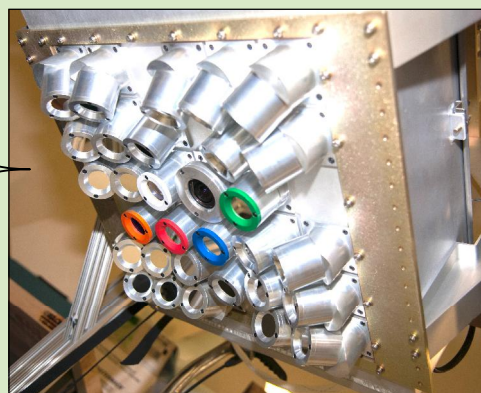
- Calibration of the Optical Energy observed by GLM
 - Background radiance (day/night)
 - Signal radiance
- Validate GLM events while observing the same storms
 - location accuracy in space and time
- Determine GLM Detection Efficiency

Constraints

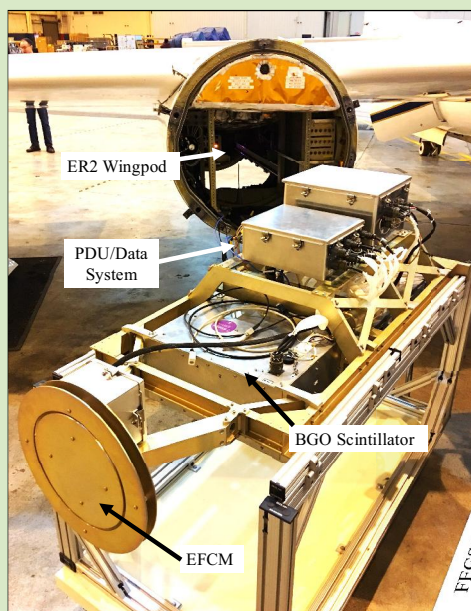
Spec	Requirement	Constraints	Determine
Spatial Resolution	> GLM spatial resolution (8 x 8 km)	ER-2 flight altitude	IPOV 18 deg
			FOV 90 deg
		Cloud top height	Looking Angles Δ18 deg
Temporal Resolution	Resolve variation of signal over GLM integration (2 ms)	Previous measurements	Resolution 2 x 2 km
			Sample Rate 100 kHz
			Signal BW ≤ 50 kHz
			Disk Space ≥ 500 GB
Sensitivity	Detect signals below GLM threshold	Background and Signal estimates	Memory Allocation 100 ms pre-trigger
			Triggering Optical or External
			RMS Noise ≤ 1.5 nA

Design

- 5 x 5 array of radiometers
 - OI: 777 nm
 - 5 extra spectral channels
 - UV: 337 nm
 - UV: 400 nm
 - NI: 500 nm
 - Hα: 660 nm
 - N2: 675 nm
 - WideBand: 400-1000 nm
- Wide Angle Camera, 60fps
- Electric Field Change Meter
- High Energy Particle Detectors



Integration and Test Flights



- ER2 integration at NASA AFRC in November 2016
- Conducted two engineering test flights
- Observed surface and cloud background radiances

